

ART 34 AMT

1 CLAIMS

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3 1. Method for assessing the integrity of a structure
4 (20), comprising the steps of:

5

6 i) collecting data relating to the initial
7 dimensions of the structure (20),

8 ii) creating a computer model of the structure
9 (20),

10 iii) collecting data relating to the estimated load
11 on the structure (20),

12 iv) analysing the structure (20), using the
13 computer model of the structure (20) and the
14 load data, in order to define areas which are
15 subject to relatively high stresses,

16 v) measuring, after a time interval, the
17 dimensions of the structure (20) in high stress
18 areas,

19 vi) updating the computer model of the structure
20 (20), using the results of step v),

21 vii) re-analysing the structure (20), using the
22 updated computer model and the load data, in
23 order to calculate a value for the integrity of
24 the structure.

25

26 2. Method according to Claim 1, wherein the method
27 comprises the step of:

28 viii) repeating one or more times steps v), vi) and
29 vii).

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31 3. Method according to Claim 1 or 2, wherein the
32 method comprises the step of:

- 1 ix) visualising the results of step vii).
2
3 4. Method according to Claim 1, 2 or 3, wherein the
4 method comprises the steps of:
5 x) measuring the actual load on the structure
6 (20),
7 xi) updating the data relating to the load on the
8 structure (20), and thereafter
9 xii) re-analysing the structure (20), using the
10 computer model and the updated load data, in
11 order to calculate a value for the integrity of
12 the structure (20).
13
14 5. Method according to Claim 4, wherein the method
15 comprises the step of:
16 xiii) repeating one or more times steps x), xi) and
17 xii).
18
19 6. Method according to Claims 4 or 5, wherein the
20 method comprises the step of:
21 xiv) visualising the results of step xii).
22
23 7. Method according to one of the preceding claims,
24 wherein the method comprises the step of installing,
25 after step iv), in high stress areas, a first set of
26 sensors (11) for measuring the dimensions of the
27 structure (20) in said high stress areas.
28
29 8. Method according to one of the preceding claims,
30 wherein the method comprises the step of installing,
31 after step iv), in high stress areas, a second set

1 of sensors (11) for measuring the load on the
2 structure (20) in said high stress areas.

3

4 9. Method according to Claim 7 or 8, wherein the
5 method comprises the step of connecting the sensors
6 (11) to a processing means (14), such as a computer,
7 for transmitting data from the sensors (11) to the
8 processing means (14) in real time.

9

10 10. Method according to one of the preceding claims,
11 wherein the method comprises the step of prior to
12 step iv), collecting data relating to known defects
13 (23,24) of the structure (20) and thereafter using
14 said defect-data, the computer model of the
15 structure (20) and the load-data for defining areas
16 which are subject to relatively high loads.

17

18 11. Method according to one of the preceding claims,
19 wherein the method comprises the step of prior to
20 step iv), estimating the minimum size of defects
21 (23,24) in the structure (20) and thereafter using
22 said estimated defect-data, the computer model of
23 the structure (20) and the load-data for defining
24 areas which are subject to relatively high loads.

25

26 12. Method according to Claim 11, wherein the
27 minimum size of the defects (23, 24) is estimated to
28 be equal to the precision of the measurement
29 equipment, used for measuring the dimensions of the
30 structure (20).

31

1 13. Method according to one of the preceding claims,
2 wherein the method comprises the step of prior to
3 step iv), collecting data relating to the load-
4 history on the structure (20) and thereafter using,
5 said load-history, the computer model of the
6 structure (20) and the load-data for defining areas
7 which are subject to relatively high loads.

8
9 14. Processing arrangement (10) for assessing the
10 integrity of a structure (20), provided with
11 processing means (14), such as a computer, for using
12 data relating to the dimensions of the structure
13 (20) and the load on the structure (20) in a
14 calculation of a value representing the integrity of
15 the structure (20), wherein the processing
16 arrangement (10) is provided with sensors (11) to
17 measure data relating to the dimensions of the
18 structure (20) and the load on the structure (20),
19 the sensors (11) being adapted to transmit said data
20 in real-time, wherein the processing means (14) are
21 provided with receiving means for receiving said
22 data and wherein the processing means (14) are
23 adapted to analyse the data in order to update the
24 calculation of the value representing the integrity
25 of the structure (20).

26
27 15. Processing arrangement (10) according to Claim
28 14, wherein the processing arrangement (10) is
29 provided with representation means (15) for
30 visualising the result of the calculation of the
31 value representing the integrity of the structure.

32

- 1 16. Processing arrangement (10) according to Claim
2 14 or 15, wherein the sensors (11) are adapted to
3 measure pressure exerted on the structure.
4
- 5 17. Processing arrangement according to Claim 14 or
6 15, wherein the sensors (11) are adapted to measure
7 temperature.
8
- 9 18. Processing arrangement (10) according to Claim
10 14 or 15, wherein the sensors (11) are adapted to
11 measure mechanical loading on the structure (20).
12
- 13 19. Processing arrangement (10) according to Claim
14 14 or 15, wherein the sensors (11) are adapted to
15 measure fluid loading on the structure (20).
16
- 17 20. Processing arrangement (10) according to Claim
18 14 or 15, wherein the sensors (11) are adapted to
19 measure vibration.
20
- 21 21. Processing arrangement (10) according to Claim
22 14 or 15, wherein the sensors (11) are adapted to
23 measure acceleration experienced by the structure.
24
- 25 22. Structure (20), such as a plant, provided with a
26 processing arrangement (10) according to Claims 14-
27 21.
28
- 29 23. A computer program product comprising data and
30 instructions that after being loaded by a processing
31 arrangement (10) provides said arrangement (10) with

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- 1 the capacity to carry out a method according to
- 2 Claims 1-13.
- 3
- 4 24. A data carrier provided with a computer program
- 5 product according to Claim 23.

AMENDED SHEET